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WALLACE'S INTRENCHING TOOL.

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(From the Proceedings of the United States Naval Institute.)
(From the Journal of the Royal United-Service Institution.)

It is not my intention this afternoon to take up the few minutes allotted to me in advocating the absolute necessity for shelter in the field from modern breech-loading fire.

This is admitted by all who have studied the question. Taking that fact as my starting point, I will go on at once to show how, in my opinion, such shelter can be gained in the quickest and most effectual way. Foreign nations long ago became alive to the importance of the matter, and all are more or less ahead of us in their preparations—Germany being, as far as I can ascertain, the most, and Italy the least, advanced. All are provided, though in varying proportion, with intrenching tools, carried either on mules or by transport or on the person.

You will have seen that Russia has greatly increased the number carried per regiment, having, I suppose, learned experience from the obstinate defense of the Turks when intrenched; indeed it is said that the want of tools was so severely felt that the men were driven to use their cooking utensils as substitutes. The Linnemann has now been adopted by them.

The northern and southern armies in America, owing to their constant employment of the spade on every possible occasion, were christened "the masters of the art of digging." And it was said, I believe, of the Austrians that "a soldier would sooner part with his rifle than his spade." Hitherto our army has entirely depended on pioneers, and on such field-intrenching tools as our generally overworked transports might be able to supply. I hope that this will be the case no longer, but that soon we shall see each soldier made self-dependent, and confident that, by the use of the spade he carries, he can hold his own against superior numbers of the enemy in the open. This can best be attained by making shelter-trench exercise a part of the regular duty of every soldier, and by always practicing him in it, not only through the year, but especially during the period of his musketry instruction, so that digging and firing may be combined, as would be the case on active service.

I need hardly say that this should be encouraged in our reserve forces, upon whom, in case of invasion, the safety of England would so greatly depend.

Various sorts of light intrenching tools have been invented and many of them tried. Some have failed from being too complicated, some from being too heavy, others from want of strength.

At last the choice seemed to lie between the Linnemann or Roumanian and the S. M. E. pattern spade. I was fortunate enough to witness, and in one instance to have to report on, the performances of those spades when issued for trial.

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The chief advantage of the Roumanian spade appeared to be its portability, but except in soft ground it was useless.

The engineers' pattern, with its pointed blade and longer handle, seemed more suitable for various work; it was, however, apt to buckle up at the end and to lose its crutch, while in the use of both spades, and especially in the Roumanian, the men's knuckles suffered greatly.

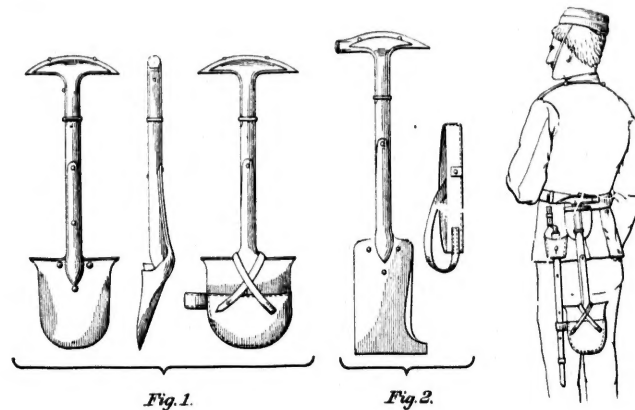
These trials taught me what were the essentials of a really serviceable intrenching tool which may be summed up in four words—

Strength, Portability, Handiness, Power.

The tool should be adapted for use in every kind of ground, rocky or soft.

Be able to cut roots and lever up stones; to break open boxes and barrels, and, at a *pinch*, loophole walls.

The tool which I have the pleasure of showing you this afternoon has passed through these tests under the supervision of Col. Sir Andrew Clarke and the Royal Engineers' Committee.



As a specimen of these official trials it will be enough to say that in ordinary soil a shelter *pit* was dug in six minutes and a shelter *trench* in twenty minutes.

On a consolidated parade ground one hour proved enough for the regulated trench; gun-pits and epaulements were thrown up, and, as an experiment, a 14-inch brick wall, strongly constructed, was loopholed in forty minutes. The proposed trials on a large scale, which I am glad it will have in the coming maneuvers will doubtless yield some useful hints for further improvements of the tool, and my suggested mode of carrying it, which I shall gladly avail myself of, whether I am permitted to have the advantage of witnessing the maneuvers or not.

I suggest it will be found useful not only for cavalry—where it saves considerable weight—and infantry in the field and camp life—for marines and naval brigade on shore, but also for steam launches, for mining purposes, and for carriage or gun limbers. I have also adapted it for the use of the Ordnance Survey by the addition of a hammer and bill-hook (Fig. 2), and in this form I think it could with advantage be carried either by the pioneers or by a proportion of the rank and file.

In conclusion, let me say that I do not propose that this small tool, weighing about 2½ lbs., and measuring 23 inches in length, should take the place of the heavier and more powerful service pick and shovel; still less do I claim for it *perfection* or indestructibility.

A tool so limited in weight and size cannot reasonably be expected to bear *anything* and do *everything* which the British soldier may be pleased to require of it; simple as it looks it is not so easy to make. But I do not hesitate to say that when made with care, and of the best material, as are all which my contractors, Messrs. Lucas & Son, have turned out, it is a *marvel* of strength and *power* for its

size and weight, and most convenient for its handiness and general adaptability, and I am sanguine that it will fulfill my expectations and justify the good opinion formed of it by the many friends who have taken an interest in it, and by the civil and military engineers who have tried it.

The thanks of the meeting were voted to Major Wallace for bringing his invention to their notice.

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Publication authorized by the SECRETARY OF WAR:

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